



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,265	09/18/2003	Donald G. Hill	560620	2264

27452 7590 12/02/2005

SCHLUMBERGER TECHNOLOGY CORPORATION
IP DEPT., WELL STIMULATION
110 SCHLUMBERGER DRIVE, MD1
SUGAR LAND, TX 77478

EXAMINER

RICHARD, CHARLES R

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/605,265

Applicant(s)

HILL, DONALD G.

Examiner

C. R. Richard

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 2,9 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: there are extraneous characters in paragraphs 6, 7, 8 and 27, as well as in several of the tables of the specification. As explained further below, this objection is maintained from the previous Office Action, since Applicant has failed to meet the requirements of 37 CFR 1.125(c). Appropriate correction is required.

2. Applicant's Preliminary Amendment received January 5, 2004 is noted. Applicant has asked that paragraph 15 of the specification be replaced. It appears that Applicant is merely correcting an error in a patent number that is part of the background art. There does not seem to be any attempt to incorporate by reference or otherwise add new matter through this amendment, so it appears proper. However, Applicant has placed this paragraph and others describing the background art in the detailed description section of the specification. It would be best if Applicant moved these paragraphs to the background section under the circumstances.

3. Applicant may wish to clarify or appropriately amend the preferred range in paragraph 25 of the specification. It appears that the general range given is narrower than the preferred range.

Claim Objections

4. Claims 2, 9 and 16 are objected to because they contain extraneous characters in the formulas. As explained further below, this objection is maintained from

Art Unit: 1712

the previous Office Action, since Applicant's explanation is (although responsive) deemed insufficient. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-4, 8-11 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP0278540B1 in view of US Patent 3,779,914 to Nimerick and optionally, further in view of US Patent 3,238,226.

The EP publication teaches compositions and methods for fluid loss control during acid fracturing that involve reversible cross linked(ing) of gelled acids (see page

2, lines 5-10). More specifically, it teaches compositions having aqueous acid, polymer, ferric salt, reducing agents, as well as methods with process steps as in those of the rejected claims (see page 2, line 44 to page 3, line 19). Specific reducing agents disclosed include hydrazine salts like the sulfate and hydroxylamine salts like the hydrochloride (see page 3, lines 15-20 as well as claims 8 and 13), which are sources of hydrazine and hydroxylamine, respectively. Note that fracture acidizing as disclosed is a form of acidizing where the pressure and flow rates are sufficient to cause formation fracture.

In essence, the EP document discloses a fracturing fluid containing an Fe^{3+} cross-linked polymer and fracturing methods. In addition, the EP document teaches that the reducing agent employed breaks the gel formed by reducing the Fe^{3+} to Fe^{2+} (see page 3, lines 44-55 of the EP document). As previously discussed, hydrazine and hydroxylamine salts are taught as possible reducing agents. There is no teaching as to carbohydrazides or semicarbohydrazides.

Nimerick teaches a fracturing fluid that includes a polymer and a hydrazine or hydroxylamine compound as a breaker (see Abstract). The polymer may be a **crosslinked** acrylamide among others (see column 4, lines 3-20). Possible hydrazine compounds taught include hydrazine salts like the sulfates and hydrochlorides as well as carbohydrazide (see column 3, lines 1-26). Possible hydroxylamine compounds include hydroxylamine salts like the sulfates and the hydrochloride (see column 3, lines 27-63).

Thus, Nimerick would have suggested to one of ordinary skill in the art at the time the present invention was made that carbohydrazide would be an acceptable substitute to a hydrazine salt as a breaker. Of course, carbohydrazide would hydrolyze in an acid solution (like that taught by the EP document) to produce hydrazine (see US Patent 3,238,226 for support for this statement). It would therefore have been obvious to one of ordinary skill in the art upon consideration of the teachings of the references cited to substitute carbohydrazide for the hydrazine salt in the compositions and methods of the EP document, thus producing compositions and methods within the scope of the rejected claims. The rejected claims are obvious.

7. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over disclosures in EP0278540B1 in view of US Patent 5,362,408 to Pakulski et al. and US Patent 5,108,624 to Bossler et al. and optionally further in view of US Patents 3,238,226; 4,202,765 and 4,476,033.

The disclosures of the EP document have been discussed previously. All the limitations of the rejected claims in the proper context are disclosed in the EP document, except for the carbohydrazides, semicarbohydrazides, ketoximes and aldoximes. As discussed previously, the EP document teaches the use of hydrazine and hydroxylamine salts as reducing agents/breakers in acid fracturing fluids and corresponding methods.

Pakulski discusses various oxygen scavengers (reducing agents) that may be similarly employed, and in particular hydroxylamine, its salts and alkyl derivatives,

Art Unit: 1712

carbohydrazide (which is noted as being “a substitute for toxic hydrazine”) and 2-butanoneoxime (see column 2, lines 5-17). There is also a discussion on the incompatibility of reducing agents and metal crosslinked gels, because of interaction of the metal and the reducing agent [the gels will be broken] (see column 2, lines 28-36). It may be of note that oximes and 2-butanoneoxime (a ketoxime) in particular were found to work well in reducing thermal degradation of fracturing fluids at least under some conditions (see column 2, lines 65-68).

Bossler’s teachings relate to use of reducing agents to deoxygenate (reduce) liquids (see Abstract). Reducing agents shown as equivalents are carbohydrazide, semicarbazide (same as semicarbohydrazide), hydroxylamine and salts, as well as certain alkyl hydrazines (see column 2, lines 12-20).

One of ordinary skill in the art, upon studying the disclosures presented here from the prior art would have concluded that carbohydrazides, semicarbohydrazides and oximes (in particular, 2-butanoneoxime, a ketoxime) would be acceptable substitutes for hydrazine and hydroxylamine as reducing agents, and it would have thus been obvious to make such substitutions. It may be helpful to note that carbohydrazides and semicarbohydrazides yield hydrazine and oximes yield hydroxylamine, respectively, upon hydrolysis in acid solution (see US Patents 3,238,226; 4,202,765 and 4,476,033 in the prior art that back up this statement), as is the composition of the EP document. In addition, it would be obvious to one of ordinary skill in the art to substitute an aldooxime for a ketoxime as reducing agent, given the similarity that both hydrolyse to hydroxylamine and that homologues with such similar structures would be expected to

Art Unit: 1712

have similar properties and utility. It may be helpful to note that the oximes (especially 2-butanoneoxime) may provide protection against **thermal** degradation of gelled fracturing fluids under certain conditions at least.

Therefore, one of ordinary skill in the art would have been sufficiently motivated and have found it obvious to use carbohydrazides, semicarbohydrazide, ketoximes (especially 2-butanoneoxime) or aldoximes as reducing agents in the compositions and corresponding methods of the EP document such that compositions and methods within the scope of the rejected claims would have been produced. The rejected claims are thus obvious.

Response to Arguments

8. Applicant's arguments filed 22 September 2005 have been fully considered but they are not persuasive. Before responding to the arguments regarding the rejections on the merits, the Examiner notes the following.

First, the Examiner acknowledges the substitute specification filed 22 September 2005. It is **NOT** entered, however, because the submission is not in compliance with 37 CFR 1.125 (c) – a marked up copy was not supplied by Applicant. The Applicant should note that the Examiner is mindful of the possibility that the changes to the specification were necessitated by a software issue in electronic submission that may have been outside of Applicant's control, but the rule requires that a marked up copy be submitted to make the changes. The objections to the specification from the previous Office Action are therefore maintained.

Second, the Examiner acknowledges Applicant's request of 22 September 2005 for amendments to claims 1, 3-4, 8, 10-11 and 17-18. These amendments are hereby entered, as there does not appear to be any issue as to support. Note that in future responses, it would be helpful if Applicant provided a summary in the Remarks of the claims being amended and explained where support for claim amendments might be found.

Third, the Examiner withdraws the earlier objection to claim 1, and the objections to claims 3-4, 10-11 and 17-18. Applicant's amendments and/or explanations were deemed sufficient. The objections to claims 2, 9 and 16 are maintained, since Applicant did not show appropriate amendments to these claims; the Examiner is not saying that Applicant failed to respond, but that Applicant's explanation was not sufficient to overcome this objection.

Moving on to the arguments regarding the rejections on the merits. The Examiner withdraws the rejection under 35 USC 102(b) over EP0278540B1, as Applicant's amendments to the rejected claims are sufficient to overcome this rejection.

The Examiner maintains both the rejections under 35 USC 103(a) from the earlier Office Action – EP0278540B1 in view of Nimerick (and another patent) and EP0278540B1 in view of Paluski, Bossler (and 3 other patents). Each of Applicant's arguments are addressed in turn and refuted. Applicant has combined the arguments for these rejections, so the Examiner gives responses accordingly in the same order as the arguments were presented.

First, as to the issue of paragraph [009] of the (substitute) specification, the Examiner fails to see how Applicant can take the position that a statement of needs must be read as an absolute requirement for Applicant's invention; the claims are written in general terms and lack any of the specifics of the cited paragraph, and a statement of needs alone is not necessarily understood to be a requirement for all species embraced by an invention. Note that the general wording of claims 1 and 8 as originally filed in comparison to their dependent claims casts much doubt as to these "requirements" being Applicant's intent at the time of filing. Also, in Applicant's own words in paragraph 26, page 12 of the (substitute) specification, "[a]ccordingly, the scope of the Invention should be limited only by the attached claims" (emphasis added) – this is followed by the claims as originally worded.

Further, this "need" is expressed in terms of lowereded toxicity and suitable reactivity and compatibility, which is relative and imprecise. In any case, the references cited against Applicant's claims recite species that Applicant says do meet these criteria, as they are what Applicant specifically calls out in these claims. It is of note that the species Applicant is now claiming are converted to hydrazine and hydroxylamine in the present invention.

As to the issue of paragraph [0027] in the (substitute) specification, the Examiner believes that Applicant is attempting to generalize from a somewhat limited field of data here. Further, there is perhaps contradiction in Applicant's statements. Carbohydrazide is taught by Applicant as being "harmful and an irritant, because it hydrolyzes to hydrazine" and 2-butanoneoxime is "a severe eye and skin irritant" (see page 13 of the

substitute specification). This appears somewhat at odds with Applicant's characterization of "low toxicity and safer for personnel and the environment" on page 8 of the Remarks. Again, it is of note that the species Applicant is now claiming are converted to hydrazine and hydroxylamine in the present invention.

In any case, the references cited against Applicant's claims recite species that Applicant says are suitable for use in the invention, as they are what Applicant specifically calls out in these claims. Also, "superior results" may not be the same as "unexpected results", and the criteria mentioned are not mentioned in the rejected claims.

A discussion from MPEP 2144.09 relating to unexpected results is instructive at this point, even though relating to a situation where the references cited are not as close to the claimed invention as they are in the present case – the references cited here actually name the compounds in the rejected claims.

However, a claimed compound may be obvious because it was suggested by, or structurally similar to, a prior art compound even though a particular benefit of the claimed compound asserted by patentee is not expressly disclosed in the prior art. It is the differences in fact in their respective properties which are determinative of nonobviousness. If the prior art compound does in fact possess a particular benefit, even though the benefit is not recognized in the prior art, applicant's recognition of the

Art Unit: 1712

benefit is not in itself sufficient to distinguish the claimed compound from the prior art. *In re Dillon*, 919 F.2d 688, 16 USPQ2d 1897 (Fed. Cir. 1991).

As to Applicant's criticism of using Nimerick, the Examiner points out that all the compounds in the lists in Nimerick are and/or are intended to produce hydrazines or hydroxylamines as polymer breakers which is what Applicant's invention is based on, and perhaps even more importantly, this is what the invention of the primary reference requires – the exact mechanism of breaking taught in Nimerick is not controlling here in regards to the appropriateness of the combination. Applicant should keep in mind that these rejections are as to obviousness (not anticipation), so the length of the list in Nimerick is not really an issue as all of the possibilities would be obvious to combine with the primary reference and one of ordinary skill in the art would thus produce Applicant's invention in this obvious process; this is also not a situation where a particular species is to be selected from a teaching of only a genus.

In addition, the rejected claims do not specify a pH beyond that it be acid, so the polymer of the claims is not necessarily crosslinked. The teaching of Nimerick's Example 10 regarding iron chlorides supports the Examiner's reference combination, if anything, despite what Applicant argues. Applicant should realize that a combination of references can be made for reasons other than what is going on in the present invention, as long as the same thing as the claimed invention is produced by the combination and making the combination is obvious to one of ordinary skill in the art

Art Unit: 1712

from the references. Note also that a third reference is cited in this rejection and its teaching is relevant in making this combination (see rejection above).

As to the issues concerning the Pakulski reference, Applicant has apparently misconstrued the main basis of the combination involved here. It is not all that relevant what is going on in the invention of Pakulski, since the reference is really cited for the teachings in its background section. The rejection makes this clear, and the combination is sound. It is somewhat puzzling that Applicant objects to the combination here, since the lower toxicity of carbohydrazide compared to hydrazine is its main basis – Pakulski specifically teaches carbohydrazide as a substitute for toxic hydrazine in the context of reducing agents (this would tend to defeat a showing of alleged unexpected results if Applicant was of the mind to present one in future). The fact that some species in the fairly short list of Pakulski may not work all that well in some applications that Applicant envisions, but does not claim, is not that relevant as far as an obviousness rejection is concerned; the basis of the rejection is the obviousness of the combination of Pakulski with the primary reference for a reason that might differ from Applicant's purposes – as long as at least one embodiment of a rejected claim is produced in this process, the claim is obvious. It is helpful to note that the rejected claims do require a reducing agent, and Pakulski does teach such agents. Applicant's arguments concerning Bossler are disposed of similarly – relevant reducing agents are shown as substitutes for hydroxylamine and hydrazines in Bossler. Note also that other references are cited in this rejection and their teaching is relevant in making this combination (see rejection above).

The following summarize some relevant law that was applied directly or indirectly above in refuting Applicant's arguments concerning the 103 rejections:

(1) the fact that Applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985);

(2) the fact that the references fail to show certain features of Applicant's invention is not relevant if the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations (as opposed to definitions) from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993); and

(3) it is not appropriate for Applicant to argue against the references individually in an obviousness rejection, as one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

Art Unit: 1712

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. R. Richard whose telephone number is 571-272-8502. The examiner can normally be reached on M-Th, 8am-6pm and alternate Fridays, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1712

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles M. Richard


PHILIP TUCKER
PRIMARY EXAMINER
ART UNIT 1712